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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/718,031 | 11/19/2003 | Mark L. DiOrio | MTB005US1P | 7148 |

27906 7590 09/20/2004

PATENT LAW OFFICES OF DAVID MILLERS
6560 ASHFIELD COURT
SAN JOSE, CA 95120

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| EXAMINER |
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NGUYEN, JIMMY

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| ART UNIT | PAPER NUMBER |
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2829

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|--|---|---|--|
| <p align="center">Office Action Summary</p> | <p>Application No.</p> <p align="center">10/718,031</p> | <p>Applicant(s)</p> <p align="center">DIORIO, MARK L.</p> | |
| | <p>Examiner</p> <p align="center">Jimmy Nguyen</p> | <p>Art Unit</p> <p align="center">2829</p> | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>0004 6/25/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The specification is objected to because
 - Page 13 line 15 probe tip "630" instead of "620"
 - Page 14 "vias 740" is not found.
 - Page 17, 18 last paragraph "probe device "915" is not found.

Correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 – 10, 13 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al (US 6621710) in view of Nakajima et al (US 5804983).

As to claims 1, 13, Cheng et al disclose (fig 3) a probing system and the method of forming a probe for testing a device (300) comprising:

Form a probe (probe card, fig 3) comprising a semiconductor die (220, 210) on which probe tips (223) are arranged in a pattern that matches a pattern of terminals (320) on the device (300); therefore Cheng et al teach the method of forming probe tips

However, Cheng et al are silent on the method of fabricating the interconnect structure from a tester to the probe tips.

On the other hand, Nakajima et al teach a tester (28) electrically connected to the probe tips (23).

It would have been obvious to one having an ordinary skill in the art at the time of the invention was made to connect the tester of Nakajima et al to the probe card system of Cheng et al for the purpose of transmitting, evaluating, controlling and analyzing the testing signal.

As to claims 2, 5, Cheng et al disclose (fig 3) the system of claim 1, wherein the device (probe card, fig 3) comprises a semiconductor material (silicon, substrate 220) that is substantially the same as material in the semiconductor die (300, also silicon).

As to claim 3, Nakajima et al disclose (fig 1) the system of claim 1 further comprising a probe card (22) including a receptacle (25, card holder) in which the probe (22) is detachably mounted (column 5 lines 65 – 67) , wherein the tester (28) makes electrical connections to the probe tips (23) through the probe card (22).

As to claim 4, The combination of Cheng et al (fig 3) disclose the system of claim 3, wherein the probe further comprises a substrate (210) on which the semiconductor die(220) is mounted; further, Nakajima et al disclose the receptacle (25) being sized to hold the substrate (22).

As to claims 6, 14 – 17, Cheng et al disclose (fig 3) the system of claim 4 and the method of claim 13, wherein the semiconductor die (210, 220) comprises contact pads (224) to which respective probe tips (223) are attached, and wire bonds (240, 241) electrically connect the contact pads (224) to the substrate (210).

As to claim 7, Cheng et al disclose (fig 3) the system of claim 1, wherein the semiconductor die comprises:

terminals (the terminals at the bottom of the board 210 through vias 211) on a bottom surface of the semiconductor die (210, 220); and

conductive vias (211) that pass through the semiconductor die (210) and provide electrical connections between the probe tips (223) on a top surface (221) of the die (210, 220) and the terminals (the terminals at the bottom of the board 210 through vias 211) on the bottom surface.

As to claim 8, Cheng et al disclose (fig 3) the system of claim 7, wherein the probe further comprises a substrate (210) on which the semiconductor die (220) is mounted, wherein the terminals (the patterns of terminals of substrate are matching with the patterns of terminals of board 210) of the semiconductor die (220) directly contact the substrate (210).

As to claim 9, Cheng et al disclose (fig 3) the system of claim 8, further comprising a probe card, wherein terminals on the substrate directly contact the probe card.

As to claim 10, Nakajima et al disclose (fig 1) the system of claim 1 further comprising a positioning system (17) adapted to position the probe (23) relative to the device (14) so that the probe tips (23) contact the terminals on the device (14).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Nakajima et al (US 5804983).

As to claim 11, Nakajima et al disclose a probe card for electrical testing of a device, comprising:

a first substrate (22) adapted for mounting on test equipment (18);

a receptacle (25) mounted on the first substrate (22); and

a probe (23) in the receptacle (25), wherein the probe includes a semiconductor die having probe tips (23) on a surface of the semiconductor die (22) in a pattern that matches a pattern of terminals on the device (14).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima et al (US 5804983) in view of Cheng et al (US 6621710).

As to claim 12, Nakajima et al disclose everything except for the probe further comprises a second substrate to which the semiconductor die is attached.


On the other hand, Cheng et al teach (fig 3) the probe further comprises a second substrate (210) to which the semiconductor die (220) is attached.

It would have been obvious to one having an ordinary skill in the art at the time of the invention was made to add the second substrate as part of the structure of the probe card for the purpose of supporting the structure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Nguyen at (571) 272-1965. Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4900.

JN.
August 13, 2004


8/18/04
LUANTHAI
PRIMARY EXAMINER